

**RECEIVED**

5 SCANSOFT, INC., ) JUN 21 2005  
6 Plaintiff, ) BROMBERG & SUNSTEIN  
v. ) C.A. No. 04-10353-PBS

VOICE SIGNAL  
8 TECHNOLOGIES, INC.,  
LAURENCE S. GILLICK,  
9 ROBERT S. ROTH,  
JONATHAN P. YAMRON,  
10 and MANFRED G. GRABHERR,

11 Defendants. )  
)

PRESUMED CONFIDENTIAL UNTIL 7/6/2005  
PURSUANT TO PROTECTIVE ORDER

ORIGINAL

16 DEPOSITION OF MANFRED G. GRABHERR, Ph.D., a  
17 witness called by and on behalf of the Plaintiffs,  
18 taken pursuant to the applicable provisions of the  
19 Federal Rules of Civil Procedure, before Dana Welch,  
20 CSR, Registered Professional Reporter, and Notary  
21 Public, in and for the Commonwealth of Massachusetts,  
22 at the offices of Bromberg & Sunstein, 125 Summer  
23 Street, Boston, Massachusetts, on June 16, 2005,  
24 commencing at 10:04 a.m.

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## I N D E X

2

3	WITNESS: MANFRED G. GRABHERR, Ph.D.		
3	EXAMINATION:	PAGE NO.	
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6	NO.	DESCRIPTION	PAGE NO.
7	(Exhibits attached to transcript.)		
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# 1 PROCEEDINGS

5 WHEREUPON,

6 MANFRED G. GRABHERR,

7 having duly sworn or affirmed that his  
8 testimony would be the truth, the whole truth,  
9 and nothing but the truth, testified as  
10 follows:

11 DIRECT EXAMINATION

12 BY MS. FLEMING:

13 Q. Would you state your name for the  
14 record please and spell it.

15 A. My name is Manfred Gernot Grabherr.

16 It 's M-A-N-F-R-E-D, G-E-R-N-O-T,  
17 G-R-A-B-H-E-R-R.

18 Q. And that's Dr. Grabherr, right?

19 A. Yes.

20 Q. Dr. Grabherr, I would like for you to  
21 tell me about your educational background after  
22 high school and with your collegiate studies.

23           A. I studied physics at the Technische  
24           Universitat Wien, which is the University of

1 computational biology is a very new field which  
2 tries to bring together people from different  
3 backgrounds. So they want to combine biology  
4 with people who know how to write -- to use a  
5 computer to do research in the area of -- well,  
6 genome research, for instance.

7 So the problem there is that you have a  
8 lot of data. If you look at a genome, then the  
9 human genome is about three billion letters  
10 long, bases. So you need computers to do  
11 anything to search or sort of analyze it. So  
12 that's the sort of thing.

13 Q. And were you hired by the Broad  
14 Institute because you have knowledge and  
15 background in computers?

16 MR. POPEO: Objection. Answer the  
17 question, if you can.

18 THE DEPONENT: It was a requirement to  
19 know how to work with computers.

20 BY MS. FLEMING:

21 Q. It was a requirement?

22 A. Yes.

23 Q. Okay. Now, how long have you been  
24 employed at the Broad Institute?

1                   MR. POPEO: Objection to form. You can  
2                   answer the question.

3                   THE DEPONENT: That's how one can track  
4                   changes, but I hardly ever use this.

5                   BY MS. FLEMING:

6                   Q. Okay. But a source, a source control  
7                   system that you described, would in your  
8                   experience, is that typically maintained by  
9                   software companies?

10                  MR. POPEO: Object to the form of the  
11                  question. If you're capable of answering  
12                  that question, you may do so.

13                  THE DEPONENT: A source control system  
14                  is designed to let companies keep track of  
15                  their changes they do during software  
16                  development; that's one of the things; I  
17                  mean, there's more things, too.

18                  BY MS. FLEMING:

19                  Q. And the Broad Institute maintains such  
20                  a source control system; is that your  
21                  testimony?

22                  A. Yes.

23                  Q. Now, if you would look at paragraph 2  
24                  of your affidavit. This indicates that you

1 or correct my question.

2 MR. POPEO: It's only because there's  
3 the transcript that she's taking down, so  
4 we want Ms. Fleming to finish her question  
5 so we can read it clean.

6 BY MS. FLEMING:

7 Q. So again, as I understand your  
8 testimony, you did not provide Mr. Roth with a  
9 copy of your vitae or resume. Mr. Roth did not  
10 ask you about the work that you did at Lernout  
11 & Hauspie. But during that interview he  
12 offered you a position with Voice Signal  
13 Technologies. Is that your testimony?

14 MR. POPEO: Object to the form of the  
15 question as it assumes a fact not in  
16 evidence. You can respond to the question,  
17 if you can.

18 THE DEPONENT: I did not understand you  
19 correctly when you said vitae. So I'm sure  
20 I gave him some form of a resume of all my  
21 previous positions, which basically said,  
22 well, I worked in speech recognition at  
23 this company, I worked at speech  
24 recognition at that company and I worked,

1 his testimony.

2 MR. POPEO: Object to form. That  
3 mischaracterizes the testimony.

4 THE DEPONENT: Yeah. If there was ever  
5 some doubt, I would assume that it's  
6 confidential.

7 BY MS. FLEMING:

8 Q. And did you treat that minor  
9 modification that you made at Lernout & Hauspie  
10 as confidential?

11 A. Yes.

12 Q. And you never disclosed it to anyone?

13 A. No.

14 Q. Did you disclose it to anyone at  
15 Lernout & Hauspie?

16 A. I don't recall. Probably.

17 Q. And what did your minor modification to  
18 the short list do, what did it achieve?

19 MR. POPEO: Object to the form. Answer  
20 the question, if you can.

21 THE DEPONENT: So from what I remember,  
22 I don't remember the specific details, but  
23 from what I remember, it reduced the memory  
24 usage.

1 you mean in some commercial sense it's  
2 beneficial?

3 MR. POPEO: Object to the form of the  
4 question. If you know the answer, you may  
5 answer.

6 THE DEPONENT: Yes, because ultimately,  
7 you don't want speech recognition systems  
8 that run on super-high-end computers. You  
9 want speech recognition systems that, you  
10 know, run on regular PCs; at least that was  
11 the goal of Lernout & Hauspie.

12 BY MS. FLEMING:

13 Q. And that was an important goal to the  
14 company, wasn't it?

15 MR. POPEO: If you know.

16 THE DEPONENT: In this -- I don't  
17 remember what the fact was of this  
18 modification. It was not a major thing.  
19 It was not something that would make or  
20 break, you know, the ability to run on a  
21 PC. But a speech recognition system is a  
22 very complex thing and you have many, many  
23 different --

24

1                   MR. POPEO: Whether or not -- the  
2                   nature of the communications that I've had  
3                   with my client are not a topic of discovery  
4                   or discussion today.

5                   MS. FLEMING: You're disclosing on the  
6                   record now that you will produce that  
7                   document on the basis that it's relevant?

8                   MR. POPEO: If the document exists, I  
9                   will determine whether it does exist, and  
10                  if so, if it responds to any discovery in  
11                  the case, then we will produce it.

12                  BY MS. FLEMING:

13                  Q. Dr. Grabherr, do you recall the  
14                  substance of the agreement that you signed with  
15                  Kurzweil?

16                  MR. POPEO: Objection. You can answer,  
17                  if you can.

18                  THE DEPONENT: I don't remember.

19                  BY MS. FLEMING:

20                  Q. Was it an employment agreement?

21                  A. It was an employment agreement.

22                  Q. Did it offer you employment?

23                  A. I don't remember what the document  
24                  said.

1 Q. Did it contain any obligations to keep  
2 information confidential that you obtained in  
3 your employment with Kurzweil?

4 MR. POPEO: Objection. Only if you  
5 remember.

6 THE DEPONENT: I don't remember.

7 BY MS. FLEMING:

8 Q. You don't remember?

9 A. I don't remember any specific things  
10 about this document.

11 Q. You don't remember if you were under  
12 any obligations to keep information  
13 confidential while you worked at Kurtzweil?

14 MR. POPEO: That wasn't the question.

15 That's a different question. You can  
16 answer that question, if you know the  
17 answer to it.

18 THE DEPONENT: It very much depends on,  
19 you know, what the document says and what  
20 the wording is. I assume that there was  
21 something in there that --

22 MR. POPEO: Just what you remember,  
23 please.

24

1 BY MS. FLEMING:

2 Q. Let's put the document aside. Do you  
3 remember or do you recall whether you were  
4 under any obligation to maintain as  
5 confidential any information you received as  
6 part of your employment with Kurzweil?

7 MR. POPEO: Object to the form. Do you  
8 recall, that's the question.

9 THE DEPONENT: I recall that was my  
10 understanding that I should keep  
11 confidential information confidential.

12 BY MS. FLEMING:

13 Q. Okay. And is it your understanding  
14 that Lernout & Hauspie acquired Kurzweil after  
15 you received that Kurzweil agreement?

16 MR. POPEO: Objection. Asked and  
17 answered.

18 MS. FLEMING: That wasn't asked and  
19 answered.

20 BY MS. FLEMING:

21 Q. You can answer.

22 A. I don't remember exactly that the flow  
23 of events was. So again, it might have been  
24 Kurzweil when I signed this; it might have been

1 Q. What in particular did you do for  
2 Lernout & Hauspie?

3 MR. POPEO: Object to the form. Answer  
4 if you can.

5 THE DEPONENT: Okay. So from what I  
6 remember, I worked on two projects. Again,  
7 I worked in the recognition development  
8 group. So I worked on Voice Xpress. I  
9 think there were different versions of  
10 Voice Xpress. And at some point I worked  
11 at the Phoenix project.

12 BY MS. FLEMING:

13 Q. What was the Voice Xpress project?

14 A. Voice Xpress is a large-vocabulary  
15 dictation speech recognition system. And --  
16 sorry. Can you say the question again?

17 MS. FLEMING: Can you read it back,  
18 please.

19 (Preceding question was read by the  
20 stenographer.)

21 THE DEPONENT: Okay. Voice Xpress was  
22 -- was a product that would allow users to  
23 use a microphone and use a large-vocabulary  
24 continuous speech recognizer to enter text

1 been developed mostly by research people in the  
2 beginning. And the reason why this would be  
3 desirable is that at some point I remember it  
4 became really hard to maintain the code base.

5 So whenever a new algorithm would  
6 become available, then it was very hard to put  
7 it in because the design was -- it was just not  
8 well designed at all. And it was a very kind  
9 of monolithic thing. And there was this desire  
10 to make the structure more modular, just more  
11 maintainable.

12 Q. Well, wasn't, in fact, the Phoenix  
13 project designed to rewrite Voice Xpress for  
14 hand-held units?

15 MR. POPEO: Object to the form of the  
16 question. If you agree with that, you can  
17 say so.

18 THE DEPONENT: The second purpose of  
19 Phoenix was to be able to run speech  
20 recognition on hand-held computers. There  
21 was kind of this -- the second idea behind  
22 this project.

23 BY MS. FLEMING:

24 Q. And you worked on Voice Xpress?

1 point became known as ELVIS. And I don't know  
2 exactly when it made the transition from just  
3 being a recognizer to being ELVIS.

4 Q. Okay. And what language model was used  
5 in the ELVIS technology that you're aware of  
6 from October of 2000 to October of 2001?

7 MR. POPEO: I object the form of  
8 question. You may answer -- you may  
9 answer --

10 MS. FLEMING: Mr. Popeo, please.

11 MR. POPEO: You may answer if you can  
12 do so without divulging any Voice Signal  
13 trade secret. With that instruction, you  
14 can go ahead.

15 THE DEPONENT: Sorry. The question  
16 again, please?

17 THE REPORTER: "Question: 'Okay. And  
18 what language model was used in the ELVIS  
19 technology that you're aware of from  
20 October of 2000 to October of 2001?'"

21 THE DEPONENT: This kind of a language  
22 model was the just straightforward thing  
23 that's published, that stores probabilities  
24 for words and word translations.

1 believe was proprietary.

2 BY MS. FLEMING:

3 Q. And is it your testimony that the  
4 storage of language models at Lernout & Hauspie  
5 was not proprietary to Lernout & Hauspie?

6 A. I don't think -- it was not  
7 proprietary.

8 Q. You think it was proprietary?

9 A. No. I think it was not proprietary.

10 Q. So I just want to be clear that I  
11 understand your testimony, that the way that  
12 Voice Signal Technologies, as you understand  
13 it, stored its language models was proprietary,  
14 but the way that Lernout & Hauspie stored its  
15 language models was not; is that your  
16 testimony?

17 A. Yes.

18 MR. POPEO: Objection.

19 THE DEPONENT: Because it's different.

20 BY MS. FLEMING:

21 Q. Why is it different?

22 MR. POPEO: You can answer the question  
23 without talking about Voice Signal's  
24 methodology.

1 MS. FLEMING: Excuse me. Mr. Popeo,  
2 have you just instructed the witness not to  
3 talk about Voice Signal's technology with  
4 respect to language models in the first  
5 year of employment of Mr. Grabherr?

6 MR. POPEO: I'm just reminding him not  
7 to disclose trade secrets of Voice Signal.  
8 But you can answer the question.

9 THE DEPONENT: Okay. So --

10 MS. FLEMING: You're reminding him not  
11 to disclose trade secrets within the first  
12 year of his employment; is that -- am I  
13 understanding your instruction?

14 MR. POPEO: The witness may be capable  
15 of answering the question without  
16 disclosing trade secrets.

17 MS. FLEMING: No. Is your instruction  
18 that he not disclose trade secrets during  
19 the first year of his employment at Voice  
20 Signal Technologies; Is that your  
21 instruction, Mr. Popeo?

22 MR. POPEO: My instruction to the  
23 witness and general instruction is that he  
24 not disclose trade secrets as a general

1 matter.

2 MS. FLEMING: Despite the Court's order  
3 in this case?

4 MR. POPEO: I'm not aware of any court  
5 order that says that we ought to be  
6 disclosing trade secrets.

7 THE DEPONENT: I think I can answer the  
8 question without disclosing confidential  
9 information.

10 So you have to keep in mind that these  
11 recognizers are really intended for very  
12 different purposes.

13 BY MS. FLEMING:

14 Q. What recognizers?

15 A. So on one hand, you have L&H Voice  
16 Xpress, and also later on, the Phoenix  
17 recognizer, and the intention there was to run  
18 in a -- in an environment in which you have an  
19 operating system, you have file storage of some  
20 sort, you have a pretty fast processor and you  
21 have a lot of memory.

22 Now, on the other hand, if you look at  
23 the ELVIS recognizer, that was designed to run  
24 on embedded systems such as cell phones, where

1                   MR. POPEO: Objection. You can answer  
2                   the question.

3                   THE DEPONENT: I'm sorry. Can you  
4                   rephrase that?

5                   BY MS. FLEMING:

6                   Q. You testified earlier that you had  
7                   access to Voice Signal Technologies source  
8                   code; is that right?

9                   A. I had access to source, yes.

10                  Q. The speech recognition source code?

11                  A. At Voice Signal?

12                  Q. Yes.

13                  A. Yes.

14                  Q. Okay. And were there components of  
15                  that source code that disclosed what the  
16                  acoustic modeling was?

17                  MR. POPEO: Object to the form. You  
18                  can answer it if you can.

19                  THE DEPONENT: I don't know if I can  
20                  answer this question. I mean, in the sense  
21                  that -- so it used this triphone  
22                  clustering. So if you look at the source  
23                  code, you will probably be able to tell  
24                  that it's a triphone-based system and not

1           Q. Okay. I'd ask you just to focus on the  
2        first sentence here and ask you, what work did  
3        you specifically do to research and develop  
4        robust speech interfaces to mobile and embedded  
5        products at Voice Signal Technologies?

6           MR. POPEO: Object to the form of the  
7        question. You can answer. Please restrict  
8        your answer to the first 12 months after  
9        you were hired and don't disclose Voice  
10      Signal trade secrets in the process.

11           THE DEPONENT: So the question is what  
12      project was I working on; is that correct?

13      BY MS. FLEMING:

14           Q. No. The question is a little bit more  
15      specific than that. What work did you do to  
16      research and develop robust speech interfaces  
17      to mobile and embedded products?

18           MR. POPEO: Same objection. You can  
19      answer.

20           THE DEPONENT: Okay. Yeah, when I  
21      started working for Voice Signal, there  
22      were a number of things Voice Signal wanted  
23      to do and all of them were for embedded  
24      applications.

1 BY MS. FLEMING:

2 Q. You don't know how to spell his last  
3 name, do you?

4 A. I do, actually. It's  
5 Z-L-O-K-A-R-N-I-K.

6 Q. Anybody else?

7 A. I hope I got it right.

8 Q. That's okay. We can correct it.  
9 Anyone else?

10 A. There was Bahman Farahani.  
11 B-A-H-M-A-N, F-A-R-A-H-A-N-I.

12 Q. Anyone else?

13 A. Yes. There was Paul Silvis.

14 Q. S-I-L-V-I-S.

15 A. Ark Khasin. A-R-K, K-H-A-S-I-N.

16 Q. N or M?

17 A. N.

18 Q. Okay.

19 A. And --

20 MR. POPEO: Only if you can recall.

21 It's not a memory test.

22 THE DEPONENT: Okay. So I think there  
23 might have been other people, but I don't  
24 remember. I think there was the core

1 group.

2 BY MS. FLEMING:

3 Q. You don't remember? Upon that  
4 instruction of your counsel, you don't remember  
5 any other names?

6 MR. POPEO: I object to the  
7 characterization.

8 THE DEPONENT: No. Wait, wait, wait.

9 MR. POPEO: If you can recall, then you  
10 should tell her. If you can't recall, then  
11 you should tell her you can't recall.

12 THE DEPONENT: It was a fairly small  
13 team and you have, including myself, five  
14 people already and I think that was about  
15 right. There might have been some other  
16 people getting pulled into this every once  
17 in a while. I don't think there were any  
18 kind of regular people on the team.

19 BY MS. FLEMING:

20 Q. Do you know the names of the people  
21 that might have been pulled in that might not  
22 have been regular members of the team?

23 A. Well, one of them --

24 MR. POPEO: I object. Don't guess. If

1 you know, you may answer the question.

2 THE DEPONENT: One of them I remember  
3 is Jim McGinnis.

4 BY MS. FLEMING:

5 Q. Tim?

6 A. Jim. M-C-G-I-N-N-I-S. I hope that's  
7 the proper spelling. And for the more  
8 technical questions, we also had embedded  
9 engineers help us; but those I don't remember  
10 specifically.

11 Q. Okay. And can you tell me what your --  
12 specifically what your work was on this team?

13 A. So my work on this team was to  
14 contribute to the design process and also  
15 implement certain parts.

16 Q. Okay. Let take each of those tasks  
17 that you just described. What did you do  
18 specifically to contribute to the design  
19 process of the recognizer?

20 MR. POPEO: Objection. Please restrain  
21 yourself to the first 12 months after you  
22 were hired and please don't disclose any  
23 trade secrets.

24 THE DEPONENT: I don't remember the

1 specific things that I contributed. This  
2 was -- we had a lot of meetings where we  
3 were just talking. And I can't really say  
4 whose idea was what. And sometimes that's  
5 also not the way it works, because somebody  
6 says, oh, I have an idea, and somebody else  
7 says, oh, that doesn't work, but if we do  
8 this then all of a sudden this becomes a  
9 more feasible thing to do.

10 BY MS. FLEMING:

11 Q. And did you understand when you were  
12 having those meetings that you were sharing  
13 confidential information?

14 MR. POPEO: Object to the form of the  
15 question. If you understand it, you can  
16 answer.

17 THE DEPONENT: You mean confidential  
18 information from who?

19 BY MS. FLEMING:

20 Q. From anyone on the team.

21 MR. POPEO: Same objection. If you  
22 understand you can answer.

23 THE DEPONENT: I don't -- can you  
24 rephrase the question?

1 BY MS. FLEMING:

2 Q. Sure. When you worked on this team and  
3 you were part of this team, was it your  
4 understanding that you were developing -- well,  
5 in fact, you said you were developing a speech  
6 recognizer, correct?

7 A. Yes.

8 Q. And you were contributing to the design  
9 process of that speech recognizer, correct?

10 A. Yes.

11 Q. And as part of your contributions to  
12 the design process, did you understand that the  
13 information you were developing was  
14 confidential to Voice Signal Technologies?

15 A. Yes. That was my understanding, right.

16 Q. And what information in particular was  
17 confidential if you can recall?

18 MR. POPEO: I object to the form of the  
19 question. If you can answer the question  
20 without divulging the confidential  
21 information itself, you can do so.

22 THE DEPONENT: Well, a lot of it is,  
23 well, how do you actually make this run in  
24 very little memory. So rather than --

1           there are two ways to approach this. And  
2           one is to start with something that's big  
3           and make it small; and the other one is  
4           start with something that's supposed to be  
5           small in the beginning. And the second way  
6           is usually what works much better.

7           So a lot of this means you have to  
8           structure things in certain ways so that  
9           you keep one part of information here and  
10           another part of the information there.  
11           Because the hope is that, you know, if you  
12           also have to distinguish between memory  
13           you can write to and memory you cannot  
14           write to. And you don't want to keep  
15           anything you don't -- are not going to  
16           modify in memory you can write to because  
17           that's precious. And so that requires you  
18           to structure this in a certain way.

19          BY MS. FLEMING:

20          Q. What way?

21          MR. POPEO: Objection. Again, if you  
22          can answer the question without divulging  
23          trade secrets, you may do so. But please  
24          don't describe a trade secret.

1                   THE DEPONENT: So it can -- you have to  
2                   organize your memory so that you're not  
3                   wasting anything, there is no overhead. So  
4                   one classical thing is you have an array of  
5                   things and you want to look up information  
6                   in there. Sometimes it's helpful if you  
7                   have something like an index table where  
8                   you say, oh, I'll just look up the index  
9                   first, that gets me right to where I want  
10                  to get this information, right.

11                  So it's like, you know, if you have a  
12                  phone directory, then you can look it up --  
13                  maybe that's not a good analogy. But  
14                  anyway. But it makes it much faster, but  
15                  you have to be willing to spend the memory  
16                  on your index table.

17                  BY MS. FLEMING:

18                  Q. How does it make it faster?

19                  A. The alternative is if you do it the  
20                  simple way, you have to go through each  
21                  individual entry that you're looking for and  
22                  that takes a long time if you have a record of  
23                  these things.

24                  Q. And what method did this team employ to

1 make it go faster?

2 MR. POPEO: Object to the form. You  
3 may answer the question, but please don't  
4 divulge a trade secret when you do so.

5 THE DEPONENT: No. I'm just using this  
6 as an example. So I'm not saying this is  
7 one of the particular problems.

8 BY MS. FLEMING:

9 Q. Let me ask you a question, sir. In  
10 forming your answer to this question and the  
11 previous two questions, have you -- is part of  
12 your answer based on confidential information  
13 that you have not disclosed to me?

14 MR. POPEO: Object to the form of the  
15 question. If you understand it, you can  
16 answer it.

17 THE DEPONENT: Well, a lot of it has to  
18 do with the fact that I just can't remember  
19 the specifics of what we did. I mean, if  
20 you ask me -- if you tell me now, show me  
21 the source code and say, oh, okay.

22 BY MS. FLEMING:

23 Q. If I showed you the source code?

24 A. If you showed me the source code and

1 tell me, well, this is the way you did it, I  
2 would say yes, now I remember. But out of the  
3 top of my head, I just don't remember these  
4 things because they're very -- sometimes very  
5 small details.

6 Q. Sure. So without looking at the source  
7 code, you can't recall what the specific  
8 contributions were this team made in the early  
9 speech recognition engine that was being  
10 developed as part of this team that you just  
11 testified about?

12 MR. POPEO: Object to the form of the  
13 question. It mischaracterizes. You can  
14 answer the question if you can.

15 THE DEPONENT: And one thing that I  
16 remember is that we went through each  
17 possible data structure and tried to figure  
18 out how can we organize this such that it  
19 takes up the least amount of memory.

20 BY MS. FLEMING:

21 Q. And do you recall what techniques you  
22 came up with?

23 MR. POPEO: Object to the form. Again,  
24 if you can answer the question without

1           divulging a trade secret you may do so.

2    BY MS. FLEMING:

3           Q.    Can you answer that question with  
4    divulging a trade secret?

5           MR. POPEO:   In other words, if you're  
6    remembering a trade secret --

7           MS. FLEMING:   Excuse me, sir; it's my  
8    question.

9           THE DEPONENT:   No, I understand.   No, I  
10    don't think I could.

11    BY MS. FLEMING:

12           Q.    You can't answer that question with or  
13    without confidential information?

14           A.    Right.

15           MS. FLEMING:   Okay.   Can you read me  
16    back the question?

17           THE REPORTER:   "Question: 'And do you  
18    recall what techniques you came up with?'"

19    BY MS. FLEMING:

20           Q.    Why can't you answer that question?

21           A.    Because I simply don't remember.   I  
22    mean, see, these are very detailed things that  
23    we did.

24           Q.    And you can't remember unless you

1 recall the specific techniques that the team  
2 came up with in those early stages to build the  
3 speech recognition engine; is that right?

4 A. That's right.

5 Q. And it would be helpful if you had the  
6 source code to look at to determine whether it  
7 would refresh your memory, correct?

8 MR. POPEO: Object to the form of the  
9 question. You can answer it, if you can.

10 THE DEPONENT: If I were to look at the  
11 source code, then probably a lot of it  
12 would come back, yes.

13 BY MS. FLEMING:

14 Q. Okay. Now --

15 MR. POPEO: Let's take a break whenever  
16 you have a chance. It's after 1:00.

17 MS. FLEMING: Do you want to take a  
18 lunch break. It's 1:00 now.

19 THE DEPONENT: That would be good.

20 MS. FLEMING: How long would you need?

21 MR. POPEO: 45 minutes maybe.

22 MS. FLEMING: So we'll come back  
23 at 1:45.

24

1                   So what people have found to be helpful  
2        for speech recognition is to look at, let's say  
3        three of these vectors at a time, and also  
4        compute the differences between them. And they  
5        call it the deltas because it's kind of a  
6        difference. It basically says well, how much  
7        do the values change over time.

8                   Q. Uh-huh.

9                   A. Right. And then there's another  
10       technique which some people use, others  
11       don't --

12                  Q. Before you move on, are you moving off  
13       of what is a generic speech recognizer into  
14       something else?

15                  A. No. It's just -- I mean, a generic  
16       speech recognizer, there are many techniques  
17       that people choose to use or don't use.

18                  Q. But if I understand your testimony up  
19       to the point of describing vectors, you've  
20       given me a piece of what the recognizer does,  
21       is that right, a very small piece?

22                  A. A generic recognizer, yes.

23                  Q. And --

24                  MR. POPEO: I think he's trying to tell

1 you that there might be more than one  
2 generic approach. But you can answer.

3 BY MS. FLEMING:

4 Q. And when these vectors -- when the  
5 recognizer has these vectors that it has  
6 comprised, are they associated with some  
7 probability?

8 A. No. Well, these vectors, what they  
9 represent at that point is how much of the  
10 speech signal is in a certain frequency range.  
11 So I don't know how one would introduce  
12 probabilities at this point.

13 Q. Okay. Then I misunderstood. So let  
14 me --

15 A. Okay.

16 Q. What is the next piece of what happens  
17 in a speech recognizer once the vectors are  
18 determined?

19 A. Right. So a generic recognizer for  
20 being able to recognize something, needs a --  
21 some sort of vocabulary. Right. So what is a  
22 vocabulary. A vocabulary is sometimes usually  
23 how the word is spelled, so you want to keep  
24 this information because you want to know what

1 embedded products. And you were describing the  
2 different products that Voice Signal  
3 Technologies, to your understanding, had at the  
4 time you joined the company.

5 Did -- to your knowledge did Voice  
6 Signal Technologies have any embedded products  
7 in the automotive field or for use in  
8 automobiles?

9 MR. POPEO: Objection. Answer --

10 THE DEPONENT: To the best of my  
11 knowledge, no.

12 BY MS. FLEMING:

13 Q. Okay. Now, the second question -- I'm  
14 sorry -- the second statement in that  
15 description says that "Your work will focus on  
16 challenges of implementing multilingual large-  
17 and small-vocabulary speech engines on embedded  
18 platforms." Do you see that?

19 A. Yes.

20 Q. Okay. And can you tell me what work  
21 specifically you did to focus on those  
22 challenges?

23 MR. POPEO: Object to the form of the  
24 question. You can answer it, if you can.

1 might make sense to run a large-vocabulary on?

2 MR. POPEO: As of the date of the  
3 agreement?

4 BY MS. FLEMING:

5 Q. At the time you were reviewing this job  
6 description.

7 A. I can't remember any other devices.

8 Q. And so I ask you now, what work you did  
9 in particular to focus on those challenges?

10 MR. POPEO: Object to the form of the  
11 question. You may answer, if you can.

12 THE DEPONENT: So we already talked  
13 about the design process. And I did the  
14 implementation of some source code in their  
15 ELVIS recognizer.

16 BY MS. FLEMING:

17 Q. And when you say you did the  
18 implementation of some source code, what do you  
19 mean by that, sir?

20 A. I wrote parts of ELVIS.

21 Q. What parts of ELVIS did you write?

22 MR. POPEO: Objection. You may answer.  
23 Please restrain yourself to the first 12  
24 months after you were hired.

1 it might be different triphones, you start  
2 splitting them. And by doing that you can --  
3 you get this restructure.

4 And you start searching at the  
5 beginning, the roots of the tree. And once you  
6 determine that a certain path, no matter how  
7 many words end there are at the leaf outs, once  
8 you determine that, there's no point in  
9 searching any further because the scores have  
10 gone too bad, then you can stop there.

11 Q. So the idea is to eliminate some of  
12 those hypotheses, isn't it?

13 A. Yes.

14 Q. Then you can go through the tree faster  
15 than if you had all those hypotheses in there  
16 that you had to go through, right?

17 A. Right. Because you don't have that  
18 many root nodes, so it doesn't make much sense  
19 to search the word "green" and then "greedy"  
20 twice if they're the same at the beginning; so  
21 you can reduce the number of hypotheses.

22 Q. And how do you write code to build a  
23 lexical tree?

24 MR. POPEO: Object to the form. You

1 can answer, if you can.

2 THE DEPONENT: So what you do is  
3 probably you take the first word of your  
4 dictionary. You take the second word of  
5 your dictionary and compare it to the first  
6 one. If they're totally different, then  
7 you have two different entries. Now you  
8 have two root nodes.

9 Then you take the third word. And you  
10 say, well, can I match this in here? No.  
11 Can I match this in here? Yes. But they  
12 split after the second phoneme. Then you  
13 take the next word out of your dictionary  
14 and you just build this lexical tree.

15 BY MS. FLEMING:

16 Q. And is that how you built the lexical  
17 tree for this particular module for ELVIS?

18 MR. POPEO: Objection to form.

19 THE DEPONENT: I don't remember that.  
20 It might be.

21 BY MS. FLEMING:

22 Q. You don't remember how you built it?

23 A. I might have done just that. I don't  
24 remember if I did anything else.

1 about how you build a lexical tree.

2       A. The algorithm that I just described is  
3 one algorithm to build a lexical tree. All  
4 right. Now, one can think of different  
5 algorithms of building a lexical tree. Like  
6 you can, for instance, take your vocabulary and  
7 sort it which makes it somewhat easier; so  
8 that's another way of building this.

9       And I'm sure you can come up with very  
10 different ways of building trees that are not  
11 known to the public domain. But again, as long  
12 as you end up with the same tree.

13       Q. Understood. And you said that you can  
14 build it in such a way that it becomes easier.  
15 What do you mean by that?

16       MR. POPEO: Objection to form. Answer,  
17 if you can.

18       THE DEPONENT: Okay. What I -- it's  
19 not -- okay. If you sort the dictionary  
20 before, you do the same thing that I  
21 described before. Then what happens is  
22 that you don't have to search all the root  
23 nodes necessarily in order to build this,  
24 which might make it a tiny little bit

1 BY MS. FLEMING:

2 Q. I imagine that all of these scores are  
3 computed.

4 A. Yes.

5 Q. And then you're left in the module with  
6 a number of scores?

7 A. Yes.

8 Q. And in order for the scores to have any  
9 meaning, are they plotted on some kind of a  
10 distribution graph?

11 MR. POPEO: Objection.

12 THE DEPONENT: No. They were just used  
13 as absolute values.

14 BY MS. FLEMING:

15 Q. As absolute values. And how do you --  
16 what's the next step in the speech recognition  
17 process once those scores are computed?

18 MR. POPEO: Objection. I just want to  
19 clarify -- not trying to step on your  
20 question. Are you talking about the  
21 generic recognition process?

22 MS. FLEMING: All related to the work  
23 that he wrote for ELVIS prototype.

24 THE DEPONENT: Okay. From what I

1 remember, the way it works is --

2 MR. POPEO: And again, I caution you  
3 not to disclose any trade secrets.

4 THE DEPONENT: So my recollection is  
5 that after you compute the scores, what you  
6 do in the search is you want to add them up  
7 over time to get an accumulated score for a  
8 whole hypothesis. Right. And now, from  
9 time to time you might decide to just, you  
10 know, remove the bottom of the score.

11 So if the scores are 1,005, 1,010,  
12 1,015, it's the same as, I don't know, 2,  
13 5, 15; so the thousands don't matter  
14 because you only compare hypotheses against  
15 each other. Whether I did that or not, I  
16 don't remember.

17 BY MS. FLEMING:

18 Q. Now, in the answer that you just stated  
19 for the record, did you withhold any trade  
20 secret information from your answer?

21 MR. POPEO: Object to the form. You  
22 can answer, if you can.

23 THE DEPONENT: No, I don't think so.

24

1 BY MS. FLEMING:

2 Q. You don't think so, but you may have?

3 A. What I was just talking about, about  
4 adding the scores? No. There was nothing.

5 Q. And what do you know about -- what do  
6 you know about Gaussian curves as they relate  
7 to speech recognition?

8 MR. POPEO: Object to the form of the  
9 question. You may answer the question, if  
10 you can.

11 THE DEPONENT: That's a term used to,  
12 as far as I know, to describe the theory  
13 about speech recognition where you have  
14 mixtures and Gaussians. But in practical  
15 terms, what it comes down to is you have  
16 these two vectors and you compare them and  
17 you compute a score based on some sort of a  
18 distance measure.

19 BY MS. FLEMING:

20 Q. And that distance measure, does it look  
21 like a Gaussian curve?

22 MR. POPEO: Objection.

23 THE DEPONENT: I don't really know what  
24 you mean by that.

1 BY MS. FLEMING:

2 Q. And that's how it works in a generic  
3 recognizer; is that right?

4 A. This is something that's also common to  
5 most recognizers of this work.

6 Q. And is that how it worked in the ELVIS  
7 prototype?

8 A. Yes.

9 Q. Okay. And is that how it worked in the  
10 Phoenix project?

11 MR. POPEO: Objection.

12 THE DEPONENT: Yes.

13 BY MS. FLEMING:

14 Q. Okay. And those model states, do they  
15 have an associated probability distribution  
16 function?

17 MR. POPEO: Object to the form of the  
18 question. You may answer, if you can.

19 THE DEPONENT: I don't know what you  
20 mean by probability distribution function.

21 BY MS. FLEMING:

22 Q. Have you ever heard that term?

23 A. I think I have, yeah.

24 Q. In what context?

1 A. I don't remember.

2 Q. Have you ever heard the term PDF?

3 A. I don't think so. Oh, is it the  
4 acronym for probability -- oh, okay. Sorry.

5 MR. POPEO: That's okay. You just  
6 answer the best you can. If you haven't  
7 heard it, you haven't heard it.

8 THE DEPONENT: Okay.

9 BY MS. FLEMING:

10 Q. Did the ELVIS prototype that you worked  
11 on in your first year at Voice Signal  
12 Technologies model duration of speech?

13 MR. POPEO: Object to the form of the  
14 question.

15 THE DEPONENT: Can you rephrase the  
16 question, please?

17 BY MS. FLEMING:

18 Q. Well, are you familiar with the term  
19 duration modeling?

20 A. If by that -- I mean, I wouldn't use  
21 this terminology, but if by that, you mean the  
22 problem of -- well, if you're talking about  
23 speech recognition, one of the problems is that  
24 not everybody says the same word at the same

1 BY MS. FLEMING:

2 Q. Yes.

3 A. Okay. No, there is not.

4 Q. So ELVIS does not use duration  
5 modeling?

6 A. It does use duration modeling, but it  
7 does not use a certain probability assigned to  
8 whether it's better to stay within a state or  
9 transition to another state.

10 Q. Why not?

11 MR. POPEO: Object to the form of the  
12 question. You may answer, if you can do so  
13 without divulging a trade secret.

14 THE DEPONENT: I don't know.

15 BY MS. FLEMING:

16 Q. You don't know or you can't divulge it  
17 without involving a trade secret?

18 A. I don't know. I don't think it helps  
19 much with the recognition process. This is  
20 just something that people tried to increase  
21 accuracy and I don't know how much that helps  
22 at all, if it helps at all.

23 Q. Whether it helps or not, does the ELVIS  
24 prototype use that type of duration modeling?

1 MR. POPEO: Objection. Asked and  
2 answered.

3 THE DEPONENT: No.

4 BY MS. FLEMING:

5 Q. It doesn't?

6 A. It doesn't.

7 Q. But it uses duration modeling?

8 MR. POPEO: Objection.

9 THE DEPONENT: Yes. That's what the  
10 hidden Markov model is all about.

11 BY MS. FLEMING:

12 Q. How did the ELVIS prototype model  
13 duration?

14 MR. POPEO: Object to the form of the  
15 question. You can answer, if you can  
16 without divulging trade secrets.

17 THE DEPONENT: This is the process that  
18 I just described.

19 BY MS. FLEMING:

20 Q. And the process you just described --

21 A. It's the basic --

22 MR. POPEO: Generic.

23 THE DEPONENT: Well, it's the way in  
24 which hidden Markov models work. And these

1 that your testimony is that the ELVIS prototype  
2 did not employ that kind of duration modeling,  
3 that is, with the penalties and the  
4 probabilities?

5 MR. POPEO: Objection. Asked and  
6 answered. You may answer again.

7 THE DEPONENT: Right. So -- it did  
8 not.

9 BY MS. FLEMING:

10 Q. It did not?

11 A. It did not employ this penalties in the  
12 transitions.

13 Q. Now, I asked you earlier if you were  
14 familiar with the term mixture modeling; do you  
15 remember that?

16 A. Yes.

17 Q. Okay. Does mixture modeling employ the  
18 use of triphone clustering?

19 MR. POPEO: Object to the form of the  
20 question. You can answer if you can.

21 THE DEPONENT: I don't understand the  
22 question.

23 BY MS. FLEMING:

24 Q. So I take it if I asked you if mixture

1 that describes.

2 Q. What's your understanding of it?

3 MR. POPEO: Objection. You can provide  
4 your understanding.

5 THE DEPONENT: Okay. My understanding  
6 is that it's a name for one of Voice  
7 Signal's products, but I don't know exactly  
8 what's in there.

9 BY MS. FLEMING:

10 Q. During the time you were employed by  
11 Voice Signal Technologies, do you know if ELVIS  
12 was ever licensed to anyone?

13 MR. POPEO: Objection to the form of  
14 the question. If you know.

15 THE DEPONENT: So that's during my  
16 entire time of --

17 BY MS. FLEMING:

18 Q. Yes.

19 MR. POPEO: Let's answer within the  
20 first 12 months of your employment, please.  
21 The question is do you know?

22 THE DEPONENT: Do I know if it was  
23 commercially employed?

24

1       questions, and of course, if you can't answer a  
2       question because you haven't read the document,  
3       please let me know that.

4           A.    Okay.

5           Q.    Does this application for an invention  
6       describe any product of Voice Signal  
7       Technologies?

8           MR. POPEO:   Object to the form of the  
9       question.   The document speaks for itself.  
10       But you can answer it if you can.

11           THE DEPONENT:   I'm sorry.   Can you ask  
12       me the question again?

13       BY MS. FLEMING:

14           Q.    Sure.   You're a co-inventor on this  
15       patent application; is that right?

16           A.    Right.

17           Q.    And do you know whether this patent --  
18       well, do you know whether this patent or the  
19       invention that's described in the patent  
20       describes any product of Voice Signal  
21       Technologies?

22           MR. POPEO:   Object to the form of the  
23       question.   You may answer.

24           THE DEPONENT:   I'm not familiar with

1 recording and playback." Do you see that?

2 A. Yes.

3 Q. Did I read that accurately?

4 A. I think so, yeah.

5 Q. Having read the abstract with me, can  
6 you tell me what contributions to this patent  
7 application you, yourself, have made?

8 MR. POPEO: Object to the form of the  
9 question. And I object to the extent that  
10 you read from the abstract, but not from  
11 the claims of the patent application,  
12 itself. But if you can answer the  
13 question, you may do so.

14 THE DEPONENT: This is -- I don't think  
15 I really can answer this question, what  
16 specific contributions I made. I mean, if  
17 you look at the abstract, this covers a  
18 whole variety of things; some of them I  
19 have some vague understanding what they  
20 describe, and others, I just have no idea  
21 what they are.

22 BY MS. FLEMING:

23 Q. Well, let's go through them and see  
24 what you have a vague understanding of.

1                   THE DEPONENT: I'm sorry; can you  
2                   rephrase that?

3    BY MS. FLEMING:

4    Q. Sure. Did you make some contributions  
5    at Voice Signal Technologies about the  
6    development of that correction mode?

7                   MR. POPEO: Object to the question.

8                   Are you now talking generically at Voice  
9                   Signal Technologies rather than with  
10                  respect to the claims of this patent?

11                  MS. FLEMING: No, with respect to this  
12                  patent.

13                  MR. POPEO: So just focus with respect  
14                  to contributions which you may have made on  
15                  the claims of the patent application.

16                  THE DEPONENT: Okay. So if you're  
17                  talking about the actual user interface,  
18                  then I don't think I made any contribution  
19                  there.

20    BY MS. FLEMING:

21    Q. Okay. Is this an application for a  
22    user interface?

23                  MR. POPEO: Objection. If you know.

24                  THE DEPONENT: To me, it looks like

1 you see that?

2 A. Yes.

3 Q. What does that mean to you?

4 MR. POPEO: Object to the form of the  
5 question. The document speaks for itself.  
6 If you can, answer it.

7 THE DEPONENT: I don't know what that  
8 means.

9 BY MS. FLEMING:

10 Q. You don't know. How about the next  
11 one: "Responding to the generation of the  
12 first user input by performing  
13 large-vocabulary, recognizing on one or more  
14 utterances in a prior language,  
15 context-dependent mode, which recognizes at  
16 least the first word of such recognition,  
17 depending in part on language model context  
18 created by a previously recognized word." Do  
19 you see that?

20 A. Yes.

21 Q. Do you understand what that means?

22 MR. POPEO: Same objection. This is a  
23 legal document which speaks for itself.  
24 You can answer it, if you can.

1                   THE DEPONENT: So what it might mean,  
2                   but this is just really speculation, is  
3                   there might be some context in which --  
4                   allows you to use a language model score  
5                   based on what the previous word on the  
6                   screen is.

7     BY MS. FLEMING:

8     Q. Did you, Dr. Grabherr, make any  
9     contributions to this patent or this invention  
10    that are described in that section that I just  
11    read to you and you just testified to about?

12    MR. POPEO: Object to the form of the  
13    question.

14    THE DEPONENT: I can't really --

15    MR. POPEO: If you recall, you may  
16    answer.

17    THE DEPONENT: I can't -- I can't  
18    really tell what that is, what it means. I  
19    mean, I don't know for sure what this  
20    really is talking about.

21    BY MS. FLEMING:

22    Q. And am I correct that your  
23    understanding of looking at this patent  
24    application is that this is an application for

1 Q. Okay. And would you agree with me that  
2 you were sent a copy of this electronic mail?

3 A. Yes, that's what it looks like.

4 Q. Your name is down there as a recipient,  
5 isn't it?

6 A. Yes.

7 Q. And this electronic mail indicates --  
8 well, in the electronic mail, Mr. Gillick  
9 states, "We are presently working on an ELVIS  
10 patent that we would like to file by early in  
11 September"; is that right?

12 A. Yes.

13 Q. And the purpose of the meeting is "To  
14 either identify novel technical characteristics  
15 in our current implementation of ELVIS or to  
16 come up with other novel ideas that would be  
17 important contributions to ELVIS." He goes on  
18 to say, "We are specially interested in  
19 innovations that facilitate large-vocabulary  
20 recognition in a hand-held device with flash."  
21 Did I read that accurately?

22 A. Yes.

23 Q. Is this electronic mail inviting you  
24 to a meeting?

1                   MR. POPEO: Object to the form of the  
2                   question. Document speaks for itself. But  
3                   you can answer, if you know.

4                   THE DEPONENT: That's what it looks  
5                   like.

6                   BY MS. FLEMING:

7                   Q. And do you recall attending such a  
8                   meeting where the ELVIS patent was discussed?

9                   A. I don't remember.

10                  Q. You don't remember. Do you recall  
11                  participating in any meetings in which any  
12                  patents of Voice Signal Technologies were  
13                  discussed?

14                  MR. POPEO: Object to the form of the  
15                  question.

16                  THE DEPONENT: Within the duration of  
17                  the first year?

18                  MR. POPEO: Yes.

19                  BY MS. FLEMING:

20                  Q. If that's how you intend to answer the  
21                  question.

22                  MR. POPEO: That is how he's instructed  
23                  to answer the question.

24                  THE DEPONENT: Okay. In the first

1 it's still there.

2 BY MS. FLEMING:

3 Q. And personal digital assistants have  
4 technology for flash as well, don't they?

5 MR. POPEO: Object to the form of the  
6 question. You may answer it, if you know.

7 THE DEPONENT: I don't know.

8 BY MS. FLEMING:

9 Q. Mini computer?

10 A. Mini computers?

11 MR. POPEO: Same objection.

12 BY MS. FLEMING:

13 Q. You don't know what a mini computer is?

14 A. No.

15 Q. Flash technology used on personal  
16 computers?

17 A. Probably not.

18 Q. So your testimony is flash technology  
19 is only used on cell phones?

20 MR. POPEO: Objection.

21 THE DEPONENT: That's what I believe,  
22 yeah.

23 BY MS. FLEMING:

24 Q. On what do you base that belief?

1 A. Well --

2 MR. POPEO: Object to the form.

3 Answer, if you can.

4 THE DEPONENT: Okay. So you need  
5 permanent -- so flash is some sort of a  
6 kind of like a permanent storage, right.  
7 So it's some sort of an attempt to make up  
8 for the nonexistent hard disk drive; right.

9 And so on a cell phone, it makes  
10 perfect sense to have flash there, because  
11 you do want to store certain things, data,  
12 the pictures you just took or whatever,  
13 somewhere where they don't get lost if you  
14 turn the cell phone off.

15 Now, it wouldn't make such sense to use  
16 this technology on a PC, because usually  
17 these things are not huge and it's much,  
18 much cheaper to have a large hard disk  
19 drive where you can store all your data and  
20 it's going to still be there, even if you  
21 turn it off.

22 On the PDA, I'm not sure because what  
23 you do is you have a lot of memory anyway  
24 already there, whether it makes sense to

1 have it, I don't know, whether they have it  
2 or not, I don't know.

3 BY MS. FLEMING:

4 Q. You just don't know?

5 A. I just don't know.

6 Q. And you are -- let me just ask you.

7 You did not -- or did you communicate to Mr.

8 Bob Roth any novel technical characteristics in  
9 the current implementation of ELVIS?

10 MR. POPEO: Object to the form.

11 Answer, if you recall, please.

12 THE DEPONENT: I don't remember.

13 BY MS. FLEMING:

14 Q. And did you communicate to Mr. Roth any  
15 novel ideas that would be important  
16 contributions to ELVIS?

17 MR. POPEO: Same objection.

18 THE DEPONENT: I don't remember.

19 BY MS. FLEMING:

20 Q. Did you ever communicate to Mr. Bob  
21 Roth in your first year of employment at Voice  
22 Signal Technologies?

23 A. Communicate, meaning talking?

24 Q. Any communication.

1                   MR. POPEO: I object. The witness is  
2                   instructed only to disclose those matters  
3                   on which he worked during the 12-month  
4                   period after he was first hired by the  
5                   company.

6     BY MS. FLEMING:

7     Q. Can you answer that question?

8     MR. POPEO: If you know, please.

9                   THE DEPONENT: So in the first year, I  
10                  don't remember what I worked on with him.  
11                  I don't remember when he started either,  
12                  so --

13    BY MS. FLEMING:

14    Q. At any time that you worked at Voice  
15    Signal Technologies, do you remember working  
16    with Mr. Yamron on particular projects?

17    A. Yes.

18    Q. You do?

19    A. I remember -- sure, I don't remember  
20    all of it, but I remember particular things.

21    Q. Is there any particular piece of work  
22    that you can testify to today having worked on  
23    with Mr. Yamron at Voice Signal Technologies?

24                   MR. POPEO: Object to the form, which

1 design document. And he raises a few points  
2 about the master wordlist design in general.  
3 It was not uncommon at Voice Signal to discuss  
4 certain things. So you were not actually  
5 working on something, but you were talking  
6 about something.

7 Q. Is it fair to say he was eliciting  
8 answers from you about some of his questions  
9 here?

10 MR. POPEO: Object to the form of the  
11 question. If you know the answer to that  
12 question, you can answer.

13 THE DEPONENT: Well, I don't remember.  
14 Just by reading it, this is what it looks  
15 like.

16 BY MS. FLEMING:

17 Q. Do you remember if you responded to his  
18 electronic mail?

19 A. I don't remember.

20 Q. He asks in the first bullet of his  
21 comments here, do these formatting properties  
22 belong in master wordlist, and if not, where do  
23 they go? Do you see that?

24 A. Yes.

1 Q. Do you know what's prompting him to ask  
2 that question?

3 MR. POPEO: Object to the form of the  
4 question. You're asking whether this  
5 witness knows what prompted Jon Yamron to  
6 ask that particular question?

7 MS. FLEMING: Yes.

8 MR. POPEO: If you know the answer, you  
9 may answer.

10 THE DEPONENT: I don't remember.

11 BY MS. FLEMING:

12 Q. And you can't tell from the text that's  
13 written above his question what's prompting him  
14 to ask that question?

15 MR. POPEO: Same objection. Don't  
16 guess. If you know, you may answer.

17 THE DEPONENT: I would have to guess.

18 BY MS. FLEMING:

19 Q. And the second bullet, Mr. Yamron  
20 states, "We should be cautious about not  
21 hard-coding restrictions on the ranges of  
22 various quantities." Do you see that?

23 A. Yes.

24 Q. Then he says "e.g., unigram scores,

1 class IDs"?

2 A. Yes.

3 Q. What's your understanding of unigram  
4 scores?

5 MR. POPEO: Objection. You may answer.

6 THE DEPONENT: I know what a unigram  
7 score is, which is a form of language model  
8 score or it's derived from a probability.

9 Now, again, I can just read this and then  
10 try to make a guess on what he is talking  
11 about.

12 BY MS. FLEMING:

13 Q. Well, I don't want you to guess, but  
14 I'd like to know what your understanding of the  
15 phrase "class IDs" refers to, or class I-D-S?

16 A. That I don't know.

17 Q. You don't know. Is there any reason  
18 that Mr. Yamron would have included you in this  
19 electronic mail distribution listed based on  
20 the fact that this discussed a design document?

21 MR. POPEO: Object to the form of the  
22 question. If you know, you can answer.

23 THE DEPONENT: It's possible. I don't  
24 remember.

1 tokenization mean anything to you?

2 MR. POPEO: Object to the form. You  
3 can answer.

4 THE DEPONENT: Tokenization is -- okay.

5 This is my -- what it could be. So  
6 tokenization in this context could refer to  
7 text preprocessing, or postprocessing for  
8 that matter.

9 BY MS. FLEMING:

10 Q. Does it have any significance in speech  
11 recognition?

12 MR. POPEO: Object to the form of the  
13 question. If you know, please.

14 THE DEPONENT: Well, what -- it's used  
15 for different things really. So it's --  
16 from what I remember, it's the technique of  
17 taking, for instance a text file with  
18 punctuations and separating the  
19 punctuations from the preceding words  
20 because there's no space between them,  
21 something like that. It could just mean  
22 you have some stream, cut it up into  
23 certain pieces.

24

1 Q. Do you remember receiving a copy of  
2 this document?

3 A. I don't remember receiving it.

4 Q. Do you remember participating in a  
5 meeting about the master wordlist on May 8th,  
6 2001?

7 MR. POPEO: Object to the form.

8 THE DEPONENT: I don't remember.

9 BY MS. FLEMING:

10 Q. Okay. In the text of the communication  
11 from the person whose name is redacted, it  
12 says, "Can we get together briefly, say for a  
13 half hour at 4:00 tomorrow to talk about this  
14 and to resolve the issue of associating unigram  
15 scores with pronunciations." Did I read that  
16 correctly?

17 A. Yes.

18 Q. And then in parentheses following that,  
19 it says, "LG and MG have differing opinions  
20 about this"; is that right?

21 A. Yes.

22 Q. Is the MG referred to there you?

23 MR. POPEO: Objection. If you know.

24 THE DEPONENT: Well, I mean, I don't

1 means.

2 BY MS. FLEMING:

3 Q. The very first line on the document  
4 underneath the date says, "some initial project  
5 assignments," right?

6 A. Right.

7 Q. Then your name appears?

8 A. Yes.

9 Q. And there are three lines of text, one  
10 I just read, "implement on-line implementation  
11 via"?

12 A. Right.

13 Q. The second says, "implement on-line  
14 adaptation"?

15 A. Yes.

16 Q. And the third says, "adding and  
17 removing words from pronunciation tree,"  
18 correct?

19 A. Yes.

20 Q. Does that text indicate to you any  
21 project assignments you had during your first  
22 year of employment at Voice Signal  
23 Technologies?

24 MR. POPEO: Object. If you recall.

1                   THE DEPONENT: I don't remember what  
2                   this document was about.

3                   BY MS. FLEMING:

4                   Q. You don't remember or you've never seen  
5                   this document?

6                   MR. POPEO: Objection.

7                   THE DEPONENT: I don't remember having  
8                   seen this document.

9                   BY MS. FLEMING:

10                  Q. Does the word -- does the phrase  
11                  "adding and removing words from pronunciation  
12                  tree" have any significance to you?

13                  MR. POPEO: As a generality or in the  
14                  context of this document?

15                  BY MS. FLEMING:

16                  Q. In the context of some project  
17                  assignments you might have received at Voice  
18                  Signal Technologies.

19                  A. I'm not sure.

20                  Q. What aren't you sure about?

21                  A. I think -- well, again, I remember none  
22                  of this. So I mean, I can just tell you that  
23                  if you give me the sentence, remove words from  
24                  pronunciation, adding and removing words from

1 BY MS. FLEMING:

2 Q. You don't remember performing that  
3 task?

4 A. Yes.

5 Q. Okay. Now, I want to go way back to  
6 Exhibit 2 and ask you again to turn to the page  
7 that's continuing the job description, which is  
8 marked with Bates number 03738.

9 A. Yes.

10 Q. Okay. You will recall earlier we were  
11 discussing in detail the job description.

12 A. Yes.

13 Q. And I asked you about the specific work  
14 that you did at Voice Signal Technologies. I  
15 want to -- and you answered my questions with  
16 respect to the first and second sentences of  
17 this paragraph.

18 I want to ask you what work did you do  
19 specifically to contribute to the development  
20 of novel approaches for improving human  
21 interfaces to global information  
22 infrastructure?

23 MR. POPEO: Object to the form of the  
24 question. You may answer that, if you can.

1 Q. Can you import or port sections of  
2 source code file into a data file like an LM  
3 design text file?

4 MR. POPEO: Object to the form of the  
5 question. If you know, please.

6 THE DEPONENT: These are just files.

7 You can rename to anything you like, any  
8 source code file can be renamed to any  
9 other file.

10 BY MS. FLEMING:

11 Q. Let me make sure you understand my  
12 question.

13 A. Okay.

14 Q. You've just described source code files  
15 that look very different from what this  
16 document looks like.

17 A. Right.

18 Q. Can you copy source code lines from the  
19 source code file and put it into a document  
20 like the one that's marked Exhibit 11?

21 A. Yes, you can.

22 Q. You can?

23 A. Yeah.

24 Q. Okay. You named one characteristic of

1 you know you didn't do any work in it?

2 MR. POPEO: Object to the form of the  
3 question. If that question is susceptible  
4 to an answer, you can answer.

5 THE DEPONENT: I said I don't know what  
6 this specifically refers to. It could be a  
7 number of things. Now, I can tell you what  
8 I think it could be.

9 MR. POPEO: Wait a second. The  
10 question she's asked is how you know that  
11 you didn't do any work on it? So if you  
12 can answer that question, you may answer.

13 THE DEPONENT: Right. But the answer  
14 is, if I tell you what it could be, then  
15 those were things I did not work on.

16 BY MS. FLEMING:

17 Q. What could it be that you didn't  
18 work on?

19 A. It could be that you have a language  
20 model and you have some text provided by the  
21 user of the speech recognizer, and in order to  
22 improve recognition, you can use this text to  
23 modify the language model, and therefore, more  
24 -- make it more closer to the speaking style or

1 be a module.

2 Q. What does that module do?

3 MR. POPEO: Object to the form of the  
4 question. Don't guess, please.

5 THE DEPONENT: I don't know.

6 BY MS. FLEMING:

7 Q. You don't know the purpose of that  
8 module?

9 A. I could guess, but --

10 Q. The VSTUtil module you referred to, is  
11 that part of the ELVIS speech recognition?

12 MR. POPEO: Objection. Don't guess,  
13 please.

14 THE DEPONENT: I don't remember.

15 BY MS. FLEMING:

16 Q. Do you know if it's part of the user  
17 interface?

18 MR. POPEO: Same objection.

19 THE DEPONENT: I don't remember.

20 BY MS. FLEMING:

21 Q. Who would know at Voice Signal  
22 Technologies what the VSTUtil is?

23 MR. POPEO: Object to the form of the  
24 question. If you know who would know,

1 answer, but don't guess.

2 THE DEPONENT: I don't know.

3 BY MS. FLEMING:

4 Q. Who would have known what VSTUtil was  
5 during the time that you worked at Voice Signal  
6 Technologies?

7 MR. POPEO: Same objection.

8 THE DEPONENT: I don't know.

9 BY MS. FLEMING:

10 Q. Was Paul Silvis involved in packaging  
11 software and releasing it at Voice Signal  
12 Technologies?

13 MR. POPEO: Objection. Only if you  
14 know, please.

15 THE DEPONENT: I don't remember.

16 MS. FLEMING: Let's mark this one 13.

17 (Exhibit No. 13 marked for  
18 identification.)

19 BY MS. FLEMING:

20 Q. Dr. Grabherr, the reporter has handed  
21 you another document that's part of the Voice  
22 Signal production. It's Bates marked VST  
23 04051. This is an e-mail, electronic mail,  
24 from Mr. Larry Gillick to the research at Voice

1 A. Yes.

2 Q. Okay. But it is true that the ELVIS  
3 project was in existence prior to April 19th,  
4 2001, wasn't it?

5 A. Yes.

6 Q. Okay. And what was Mr. Gillick's role  
7 with respect to the ELVIS project?

8 MR. POPEO: Objection. If you know,  
9 please.

10 THE DEPONENT: Larry Gillick was head  
11 of the Core Technology Group at Voice  
12 Signal; and so as -- in that role, he was  
13 involved with the ELVIS project.

14 BY MS. FLEMING:

15 Q. And was Paul Silvis the project  
16 coordinator?

17 MR. POPEO: Object to the form of the  
18 question. Don't guess, please.

19 THE DEPONENT: I don't know.

20 BY MS. FLEMING:

21 Q. Was Paul Silvis involved in the ELVIS  
22 project?

23 MR. POPEO: Same objection. If you  
24 know. Please don't guess.

1 recognizer; is that the speech recognizer  
2 that's referring to?

3 A. I would assume so.

4 Q. That's the speech, the ELVIS speech  
5 engine?

6 A. I can -- I don't know what exactly this  
7 is referring to. It might actually refer to a  
8 part of the speech recognition engine.

9 Q. What makes you think it -- it's related  
10 to a part of the engine?

11 A. I'm not saying that it does. I just  
12 can't rule it out.

13 Q. In April of 2001, do you recall  
14 specifically what your role was in connection  
15 with the ELVIS project?

16 MR. POPEO: If you recall.

17 THE DEPONENT: I don't remember.

18 BY MS. FLEMING:

19 Q. Okay. Does the fact that your name is  
20 next to "recognizer" imply anything about the  
21 kind of work you did in April of 2001 when on  
22 the ELVIS project?

23 MR. POPEO: Object to the form. You  
24 can answer, if you understand that.

1

## CERTIFICATE

2

3 COMMONWEALTH OF MASSACHUSETTS

4 SUFFOLK, SS

5 I, Dana Welch, Registered Professional  
6 Reporter and Notary Public in and for the  
7 Commonwealth of Massachusetts, do hereby  
certify:8 That MANFRED G. GRABHERR, the witness  
9 whose deposition is hereinbefore set forth, was  
10 duly sworn by me and that such deposition is a  
11 true record of my stenotype notes taken in the  
12 foregoing matter, to the best of my knowledge,  
13 skill and ability.14 IN WITNESS WHEREOF, I have hereunto set  
15 my hand this 16th day of June, 2005.

16

17

DANA ULRICH WELCH

18

Dana Welch, RPR

19

Registered Professional Reporter

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